Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment	)	WT Docket No. 17-79
	)	
	)	
Revising the Historic Preservation Review Process for Wireless Facility Deployments	)	WT Docket No. 15-180

COMMENTS OF ACT | THE APP ASSOCIATION

ACT | The App Association (App Association) respectfully submits its views in response to the Federal Communications Commission's (Commission's or FCC's) Notice of Proposed Rulemaking (NPRM) in the above-captioned proceeding.[1] Below, the App Association discusses the direct benefit a robust wireless network infrastructure has to the growth of the "fifth generation" (5G) ecosystem in the United States, which enables countless consumer and enterprise end users to enjoy the various software applications (app) the App Association's members create.

The App Association represents more than 5,000 small- and medium-sized app development companies and technology firms across the globe. The world has adopted mobile technology faster than any other innovation in human history. This dynamic app ecosystem continues to produce more innovative and efficient solutions that leverage mobile technologies to

[1] *In the Matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, WT Docket No. 17-79, Notice of Proposed Rulemaking (2017) *available at:* https://apps.fcc.gov/edocs_public/attachmatch/DOC-344160A1.pdf.

drive the global digital economy across modalities and segments, augmenting consumer interactions and experiences throughout their personal and work lives.

I. Strong Network Infrastructure: Necessary for the Growth of the App Economy and the Success of 5G Networks

While there is no universal definition for a 5G mobile network, the term encompasses the future wave of interoperable mobile networks being driven through various technical standards bodies today. 5G networks are expected to utilize a wide range of spectrum bands, both licensed and unlicensed, through new and innovative spectrum efficiencies and spectrum sharing arrangements. Standard bodies such as the 3GPP and the Institute of Electrical and Electronics Engineers (IEEE), among many others, continue to develop the requirements by early 2017.[2] Similar to 5G, the internet of things (IoT) will involve everyday products that use the internet to communicate data collected through sensors.[3] With machine-to-machine devices projected to account for more than half of connected devices by 2021,[4] IoT is expected to enable improved efficiencies in processes, products, and services across every sector. In key segments of the U.S.

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[2] *See* 3GPP, *The Mobile Broadband Standard, Tentative 3GPP Timeline for 5G* (Mar. 17, 2015), at http://www.3gpp.org/news-events/3gpp-news/1674-timeline_5g; see also IEEE Standards Association, Internet of Things, at http://standards.ieee.org/innovate/iot/.

[3] *See*, *e.g.*, Department of Commerce Internet Policy Task Force and Digital Leadership Team, *Fostering the Advancement of the Internet of Things* (Jan. 2017), *available at* https://www.ntia.doc.gov/files/ntia/publications/iot_green_paper_01122017.pdf.

[4] Stephanie Condon, *Report: IoT to Dominate Connected Device Landscape by 2021*, (June 8, 2017, 12:00 am) *found here:* http://www.zdnet.com/article/report-iot-devices-to-dominate-connected-device-landscape-by-2021/?mkt_tok=eyJpIjoiWkRBek5USmhNV1ZpTXpreiIsInQiOiJpOFV0Y214VHdGdmU5K2UrSmdhSXA0dUJCXC9laEFsMUpYUmx0ZkxHUEZkM2RURzdFOTFRRmYxbDRTR1REaVpldWtvMTFLeGFDTDJaYUx0TnlRWjV6Y3JBc09kQ25vejczazBaRzVOd01JS1dndjB6dnYzY1pjMDBuNVdiUDVPQVEifQ%3D%3D

economy, from agriculture to retail to healthcare and beyond, the rise of IoT is demonstrating efficiencies unheard of even a few years ago.

The nascent and hyper-competitive app industry is the driving force behind the rise of smartphones, tablets, and a growing number of internet-enabled devices. As detailed in our annual *State of the App Economy* report,[5] the app economy is led by U.S. companies and drives a thriving ecosystem worth more than $143 billion that has added 110,000 new software application developer jobs to the American workforce over the last two years. In addition, 83 percent of successful U.S. app companies are located outside Silicon Valley, many in rural areas. The App Association's *State of the App Economy* report also describes how the mobile revolution continues to improve established industries like healthcare and manufacturing. Improved infrastructure to support use of mobile apps is a condition precedent to ensuring that the app economy continues to grow, revolutionizing the consumer and enterprise experiences of all Americans.

For these reasons, the App Association supports the Commission's efforts to reduce barriers to deploying new infrastructure and to support efficacious ways to use wireless spectrum through licensed or unlicensed agreements and advanced sharing arrangements. As the growth of the app economy depends upon high-speed wireless broadband availability, an inadequate development of U.S. infrastructure and spectrum resources will harm both the economy and

[5] ACT | The App Association, *State of the App Economy, Fifth Edition* (Apr. 2017), *available at* http://actonline.org/2017/04/20/state-of-the-app-economy-report-outlines-growth-dynamism-of-the-app-ecosystem/.

consumers. Driven by a projected $275 billion investment from telecom operators,[6] 5G network and small cell deployments are expected to create 3 million new jobs and boost annual U.S. gross domestic product by $500 billion. The App Association applauds the Commission's recent steps to remove as many regulatory barriers as possible to advance more 5G deployment. U.S. infrastructure needs repair and improvement, and the App Association believes the Commission should play a central role in the deployment of a robust internet infrastructure. The Commission's efforts will play an integral role in closing the digital divide, and the App Association is committed to assisting the Commission in this respect.

As of 2013, only 73 percent of Americans had internet connectivity in the United States,[7] citing overall cost of broadband deployment to providers—either wireline or wireless—as a leading contributor to the lack of availability for consumers. Subsequent surveys demonstrated a 6 percent drop in broadband adoption in 2015.[8] Meanwhile, new and innovative IoT technologies and deployments that require robust mobile broadband connections are almost ubiquitous in today's economy.[9] This divergence demonstrates the vital need to improve access to wireless broadband.

If their potential is realized, future 5G networks will revolutionize American society across regions and industries. In our *State of the App Economy* report, we explore how

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[6] Accenture, *Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities* (Jan. 2017), *available at* https://newsroom.accenture.com/content/1101/files/Accenture_5G-Municipalities-Become-Smart-Cities.pdf.

[7] Caitlin Dewey, *The 60 Million Americans, Who Don't Use the Internet, in Six Charts*, The Washington Post (Published Aug. 19, 2013).

[8] Pew Research Center, http://www.pewinternet.org/three-technology-revolutions/.

[9] Amy Nordrum, *Popular Internet of Things Forecast of 50 Billion Devices by 2020 is Outdate*, IEEE Spectrum (Aug. 18, 2016, 1:00 PM) *found here:* http://spectrum.ieee.org/tech-talk/telecom/internet/popular-internet-of-things-forecast-of-50-billion-devices-by-2020-is-outdated.

companies, even those unaffiliated with the information and communication technology sector, are affected by this ever-evolving, interconnected IoT ecosystem. Almost without exception, IoT innovations depend upon wireless network use. For instance, Swisslog – a company specializing in integrated automation solutions – developed "Smartlift" technology, which creates an indoor, localized GPS network to aggregate data from sensors on forklifts and directional barcodes placed around the warehouse.[10] This technology allows warehouse mangers to access analytics through their tablets or mobile phones to optimize productivity and receive real-time, near-perfect inventory reports. Bobcat, an equipment company based in North Dakota, deployed Swisslog's technology in its warehouse and experienced a 30 percent increase in pallets loaded per hour "with no inventory errors."[11] None of this innovation would be possible without the ability for highly-integrated and interoperable technologies to access wireless networks.

As a further key use case, the delivery of healthcare services to Americans across the country provides an additional example of how a robust 5G wireless infrastructure can radically advance the public interest. As the Commission's public notice (PN) notes, more than 320 million people in the United States could require health care services at any time.[12] With nearly 280,000 primary care physicians on hand, this statistic becomes even more stark.[13] The wide array of connected health technology products and services in development and available today, like telehealth, remote monitoring of patient generated health data (PGHD), and telemonitoring,

[10] Swisslog, *Big Data Meets Forklifts: Smart Inventory, Labor, and Forklift Tracking*, *found here:* file:///Users/joelthayer/Downloads/SmartLIFT_Brohure.pdf.

[11] *See id.*

[12] *FCC Seeks Comment on Accelerating Broadband Health Tech Availability,* Public Notice. GN Docket No. 16-46, at p. 4 (rel. Apr. 24, 2017) (Connect2Health PN).

[13] *See id.* p. 5-6.

offer the ability to save countless American lives while lowering costs. The connected health sector is at the brink of incredible growth. It has the potential to create thousands of high-paying jobs across the United States, and the American patient remains the primary beneficiary. The critical nature of the healthcare sector mandates that improvements be made to America's critical infrastructure. This includes broadband infrastructure and measures to give healthcare providers the ability to use connected health technology products and services throughout the continuum of care, both inside and outside the doctor's office. In May, the App Association's Connected Health Initiative (CHI), the leading effort by connected health ecosystem stakeholders to encourage the responsible and secure use of connected health innovations, submitted comments in support of the FCC's PN[14] and supported efforts to address the growing need for interconnectivity in the healthcare industry.

Innovations, like these, make the actions in this proceeding all the more important, and the App Association applauds the Chairman on his leadership in developing the Commission's 5G wireless infrastructure framework. We recognize that the Commission has identified numerous barriers to wireless infrastructure deployment and appreciate its thoughtful proposals to address these barriers. Given the incredible potential for 5G networks to radically improve American lives, the App Association also supports the Commission's focus on building 5G networks to close the digital divide. The App Association applauds the Chairman's efforts to close the digital divide by establishing his "Gigabit Opportunity Zone" program as articulated in his digital empowerment agenda, which would "bring broadband and digital opportunity to our

[14] CHI Comments, GN Docket No. 16-46 (May 24, 2017) *found here:* http://actonline.org/wp-content/uploads/CHI-Comments-FCC-Connected-Health-PN-appendix-05242017.pdf; *see generally*, Connect2Health PN.

nation's most economically challenged areas."[15] The App Association urges the Commission to continue this trajectory to ensure that the necessary infrastructure is in place to facilitate more innovative mobile broadband solutions, setting an example that can be replicated globally. We remain committed to assisting the Commission in bringing the power and utility of the app economy to every American.

II. 5G Deployment is Well Underway, and the Commission Should Do All It Can to Promote This Growth

5G innovation has already begun. AT&T announced its "5G Evolution" plans to pave the way to the next generation of faster speeds for its wireless customers with the latest devices in over 20 major metro areas by the end of this year.[16] Already implemented in selected areas of Austin, AT&T wireless customers with a Samsung Galaxy S8 or S8+ can access faster 5G Evolution internet speeds. In that same Austin trial, AT&T offers twice the speeds of its 4G LTE network, and can be accessed by customers on almost all AT&T data plans with a Samsung Galaxy S8 or S8+ device.[17]

Additionally, Verizon disclosed its 5G pilot programs to provide "super-fast" wireless services in 11 U.S. cities earlier this year.[18] In partnership with Samsung and Ericsson, it will offer free trials to select customers in "Ann Arbor, Atlanta, Bernardsville, N.J., Brockton, Mass., Dallas, Denver, Houston, Miami, Sacramento, Seattle, and Washington, D.C. in the first half of

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[15] FCC Chairman Ajit Pai, Digital Empowerment Agenda, *available at* https://apps.fcc.gov/edocs_public/attachmatch/DOC-341210A2.pdf.

[16] AT&T: http://about.att.com/story/5g_evolution_to_over_20_metros_in_2017.html.

[17] *See id.*

[18] Aaron Pressman, *Verizon Testing Super Fast 5G Internet with Customers in 11 Cities*, Fortune (Feb. 22, 2017) *found here: http://fortune.com/2017/02/22/verizon-testing-5g-11-cities/.*

the year." Verizon has built out several hundred cell sites with 5G transmitters capable of reaching several thousand customer homes and businesses.[19] In their pre-commercial trials last December, Verizon and Samsung successfully demonstrated data transfers of multi-gigabit per second speeds at distances of up 1,500 feet. The trials utilized 28 GHz frequency airwaves for service to fixed points, like a home router, and Verizon plans to test 5G mobile service later this year.

This innovation is at its infancy, but, for 5G to reach maturity, the Commission must engage in a sensible, light-touch regulatory approach with a strong emphasis on economic analysis. The App Association is encouraged that the Chairman has placed cost-benefit analyses at the forefront of the Commission's decision-making process when promulgating rules, as evidenced by the Chairman's creation of the "Office of Economics and Data."[20] In his April remarks at the Hudson Institute, the Chairman elaborated on how, in the recent past, the FCC has lapsed in exercising an old bipartisan policy tradition: implementing a cost-benefit analysis when promulgating rules with the effect of law.[21] We are supportive of the Commission's changing course in this regard and hope that leadership across the political dais can work together to reach further bipartisan solutions to further the public interest.

[19] *See id.*

[20] Remarks of FCC Chairman Ajit Pai at the Hudson Institute, *The Importance of Economic Analysis at the FCC* (Apr. 5, 2017) *found here:* http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0405/DOC-344248A1.pdf.

[21] *See id.*

III. The Commission Has Ample Legal Authority to Streamline 5G Wireless Broadband Infrastructure Buildout

We agree with the FCC's assessment that there exists very little evidence, if any at all, that Congress intended to differentiate between Section 253(a) and 332(c)(7) regarding the phrase "prohibit or have the effect of prohibiting."[22] Plainly in the text, both Section 253(a) and 332(c)(7) prevent states or localities from creating regulations that "prohibit or have the effect of prohibiting" service.[23] Based on the text of the actual statutes and lack of congressional intent in their respective records, it is not apparent that Congress intended to make a distinction in this regard, making either statute a sufficient source of authority to promote a wireless 5G infrastructure.[24] We believe the Commission should clarify the overly ambiguous terms "prohibit" and "have the effect to prohibit" to accommodate the growing need for wireless broadband.

Moreover, the U.S. Supreme Court has already addressed the question as to whether Congress delegated authority to define ambiguous terms within a statute of the Communications Act of 1934 (the Act).[25] In its Notice of Inquiry (NoI), the Commission asked if it can interpret such terms and phrases (*i.e.*, "prohibit" and "have the effect to prohibit") in the Act and cited to a series of cases providing a varying standards.[26] While we understand the Commission's concern, the App Association would like to attribute the multifarious nature of certain courts'

[22] 5G Wireless Infrastructure NPRM, para. 85.

[23] 47 U.S.C. §§ 253(a), 332(c)(7)(B)(i)(II).

[24] *See Sprint Telephony PCS, L.P. v. County of San Diego*, 543 F3d 571m 579 (9th Cir. 2008) (en banc).

[25] *National Cable Telecom's Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 982-83 (2005).

[26] 5G Wireless Infrastructure NPRM, para. 87, fn. 168.

interpretation of Section 253 and 332(c)(7) to the lack of FCC guidance on this issue. The App Association recommends the Commission choose an avenue that best suits the growing consumer need for wireless broadband to ensure the integrity and growth of a strong 5G ecosystem.

For example, the Commission could institute 60-day "shot clocks" for small cell applications under Section 332(c)(7). Section 332 states that state and local governments must act on a siting request "within a reasonable period of time."[27] Within comments to the FCC in March, Verizon provided a comprehensive list of siting applications for small cell building requests. Shockingly, some state actors have sat on applications without a response for more than a year.[28] Such unacceptable delays are antithetical to Commission's goal of promoting infrastructure buildout for a national 5G network. Barriers to needed infrastructure buildouts also directly impact our members' ability to innovate, because they depend on adequate wireless network availability and capacity to provide their diverse services. Simply put, without a strong wireless network, apps cannot exist. The App Association supports the Commission's taking responsible and realistic interpretations of its authority to accomplish its public interest goals. Returning to the above-mentioned example of unreasonably delayed siting applications, the Commission should interpret the phrase "within a reasonable period of time" under Section 332(c)(7) to mean that states and local governments have 60 days to respond to a build-out request.

[27] 47 U.S.C. § 332(c)(7)(B)(ii).

[28] Verizon Comments, WT Docket No. 16-421 (Mar. 8, 2017) (Appendix A) *found here:* https://ecfsapi.fcc.gov/file/103081347813190/Complete%20Verizon%20Small%20Facility%20Comments%203-8-2017.pdf.

IV. As Part of Its Plan to Grow a 5G Wireless Ecosystem, the Commission Should Leverage TV White Spaces as Soon as Possible

Providing industry with more unlicensed bands can assist the successful deployment of 5G infrastructure. The App Association believes that unlicensed bands play a key role in the success of 5G networks, and we hope the Chairman will consider it to be a viable solution to promote the infrastructure buildout that will support IoT in the future. While this proceeding addresses a range of challenges to realizing 5G networks, the App Association believes there are further steps the Commission can take to promote greater connectivity in the short-term.

As a primary example of where immediate steps can be taken to further the Commission's goals, the Commission can resolve several pending matters related to unused TV white space (TVWS) spectrum bands. Leveraging the TVWS bands will augment mobile broadband access for U.S. rural markets, helping to bridge the digital divide and facilitating greater IoT capabilities for consumers and enterprises in the 5G ecosystem. Robust wireless connectivity enabled by TVWS bands will ensure the vitality of both our innovative app developer community and the future 5G economy. Therefore, it is imperative that the Commission utilize TVWS bands to help drive innovation and the ingenuity of the tech pioneers and small business owners who will push the 5G ecosystem forward.

As the Commission is aware, TVWS can cover vastly larger expanses than traditional WiFi routers, which is why the FCC chose it as a proposed solution to service un-served rural areas. In 2010, the Commission stated access to TVWS "enable[s] more powerful public [i]nternet connections...with extended range, fewer dead spots, and improved individual speeds;"

and ameliorate overly-congested wireless networks (a phenomenon typically referred to as "spectrum crunch").[29] The ever-growing need for broadband access in rural areas that fell out of the purview of traditional wireline and wireless radii was at the heart of the Commission's action in opening unlicensed TVWS spectrum. The Commission was rightfully compelled to act to ensure these remote areas keep pace with the 21st century and not fall through the cracks of the digital divide.

In 2015, the Commission furthered its mission to increase connectivity to rural areas through use of TVWS bands when it promulgated rules opening the 600 MHz guard bands, duplex gap, and Channel 37 band.[30] The Commission was encouraged by the impressive reach TVWS technology offered in bridging the digital divide without the traditional constraints of costly wireline or wireless deployments.[31] The Commission distinguished the extraordinary capabilities TVWS bands have to "provid[e] high data throughput service to un-served or under-served areas of the country at relatively low cost."[32] The App Association agrees that TVWS technologies should serve as a cornerstone solution to promote broadband access in these far-to-

[29] *In the Matter of Unlicensed Operation in the TV Broadcast Bands, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, ET Docket No. 04-186 & ET Docket No. 02-380, Second Memorandum Opinion and Order, 10 FCC 174 (2010).

[30] *In the Matter of Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and Duplex Gap, and Channel 37 and Amendment of Part 74 of the Commission's Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 Mhz Duplex Gap*, ET Docket No. 14-165 & GN Docket No. 12-268, Rep. & Ord., 30 FCC Rcd. 9551 (2015), https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-99A1_Rcd.pdf [TVWS R&O].

[31] *See id.* (advocating that "[t]he fixed devices that are being deployed today are typically used to provide backhaul services for Internet connectivity offered by wireless internet service providers (WISPs), schools and libraries.")

[32] TVWS R&O, para. 1.

reach areas to address two critical issues in spectrum management: access to wireless broadband for rural areas and mitigating spectrum crunch.

Although the United States has made great strides in bridging the digital divide, we agree with Chairman Pai that much work remains to be done.[33] Considering its excellent frequency characteristics and ability to cover vast areas, TVWS should be an essential component of the Commission's efforts in this regard.

Moreover, maintaining and opening more TVWS bands is aligned with the Chairman's goal of increasing competition in the internet service provider market. In 2014, Chairman Pai recognized the value of unlicensed TVWS bands have to wireless internet service providers (WISPs)—an ecosystem he describes as "flush with innovation"—when he congratulated WISP innovators on developing "TV white space solutions that help[ed] WISPs extend their reach."[34] Furthermore, he recognized that the WISP industry relies heavily on unlicensed spectrum, some of which utilize TVWS bands,[35] and even endorsed the idea of providing more unlicensed spectrum so that the FCC can assist entrepreneurs.[36] And while WISPs are an excellent use case, the App Association believes that, in facilitating greater competition in the broadband

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[33] Ajit Pai, Chairman, FCC, Remarks at the Fed. Commc'ns Comm'n (Jan. 24, 2017), *available at* http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0124/DOC-343184A1.pdf.

[34] Ajit Pai, Commissioner, FCC, Remarks at WISPapolooza (Oct. 15, 2014), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-329969A1.pdf [hereinafter WISPAPOLOOZA SPEECH].

[35] Joan Engebretson, *Despite Uncertainty, Wireless ISPs Plan to Use TV White Spaces*, TELECOMPETITOR.COM (May 21, 2012, 1:00PM), http://www.telecompetitor.com/despite-uncertainty-wireless-isps-plan-to-use-tv-white-spaces/; see also, Press Release, Carlson Wireless Technologies, Carlson and Neul launch first commercially available white space radio system created for WISPs (Mar. 12, 2012), at http://www.carlsonwireless.com/press-releases/carlson-neul-launch-first-commercially-available-white-space-radio-system-created-wisps/.

[36] Pai Speech, at p. 2 (stating I believe the FCC should be on the side of entrepreneurs like WISPs, and that means in part being in favor of unlicensed spectrum.").

marketplace, the Chairman should include focus on unleashing innovation in services that utilize unlicensed spectrum, namely the TVWS bands. Doing so will bring the benefits of TVWS to any internet service provider seeking to improve its signal coverage, as well as those on the wrong end of the digital divide.

V. CONCLUSION

In sum, the App Association applauds the Commission's action in this proceeding to close barriers to 5G and unlock opportunities for so many small-businesses and tech innovators. We believe this is the necessary first step to entering the 5G ecosystem and beyond.

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